

U.S. Patent Application Serial No. 09/594,091
Response dated September 26, 2003
Reply to OA of July 29, 2003

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (Currently Amended): A semiconductor device, comprising:

a contact;

a transistor having a first impurity region and a second impurity region formed on a semiconductor substrate, and a gate electrode formed on the semiconductor substrate;

a first insulating film on top of the transistor;

a capacitor formed on the first insulating film, the capacitor having a dielectric film made of one of a ferroelectric material and a high-dielectric material, and an upper electrode and a lower electrode positioned to put the dielectric film therebetween; and

a silicon oxide film residing on top of the capacitor to form a planarized surface;

wherein nitrogen resides all over the planarized surface of the silicon oxide film, ~~and~~

~~wherein the contact is positioned above the silicon oxide film including nitrogen.~~

Claim 2 (Original): A semiconductor device according to claim 1. wherein cavities are formed in an inside of the silicon oxide film.

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3. (Original): A semiconductor device according to claim 1. further comprising,
a second insulating film formed between the capacitor and the silicon oxide film; and
a wiring formed on the second insulating film.

4. (Original): A semiconductor device according to claim 2, further comprising:
a- third insulating film formed on the silicon oxide film.

Claim 5 (Currently Amended): A semiconductor device, comprising:
a contact;
a transistor having a first impurity region and a second impurity region formed on a
semiconductor substrate, and a gate electrode formed on the semiconductor substrate;
a first insulating film residing on top of the transistor;
a capacitor formed on the first insulating film, the capacitor having a dielectric made of
one of ferroelectric material and a high-dielectric material, and an upper electrode and a lower
electrode positioned to put the dielectric film therebetween;
a second insulating film formed on the capacitor;
a local interconnection formed on the second insulating film to electrically connecting the
upper electrode of the capacitor with the first impurity region;
a third insulating film formed on the local interconnection and the second insulating film;
a first wiring formed on the third insulating film and electrically connected to the

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second impurity region via a hole which is formed on the first insulating film, the second insulating film, and the third insulating film;

a fourth insulating film on top of the first wiring to serve an upper planarized surface, wherein nitrogen resides ~~on top of~~ all over the upper planarized surface of the fourth insulating film; and

~~wherein the contact is positioned above the fourth insulating film including nitrogen; and~~
a second wiring formed on the fourth insulating film.

6. (Original): A semiconductor device according to claim 5,
wherein cavities, a part of which are exposed from the upper surface of the fourth insulating film, are formed in an inside of the fourth insulating film.

7. (Original): A semiconductor device according to claim 6,
wherein the cavities are located in regions between a plurality of capacitors.

8. (Original): A semiconductor device according to claim 6, further comprising:
a fifth insulating film formed on the fourth insulating film to cover the cavities which are exposed from the upper surface of the fourth insulating film.

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9. (Original): A semiconductor device according to claim 5, wherein the second wiring is connected to the first wiring via the hole formed in the fourth insulating film.

10. (Original): A semiconductor device according to claim 5, wherein the third insulating film and the fourth insulating film are formed of a silicon oxide film.

11. (Original): A semiconductor device according to claim 5, wherein an upper surface of the first insulating film is a planarized surface.

Claim 12 (Currently Amended): A semiconductor device, comprising:

a contact;

a transistor having a first impurity region and a second impurity region formed on a semiconductor substrate, and a gate electrode formed on the semiconductor substrate;

a first insulating film on top of the transistor;

a capacitor formed on the first insulating film, the capacitor having a dielectric film made of one of a ferroelectric material and a high-dielectric material, and an upper electrode and a lower electrode positioned to put the dielectric film therebetween; and

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a second insulating film on top of the capacitor to serve as an upper planarized surface;

wherein nitrogen resides ~~on top of~~ all over the upper planarized surface of the second

insulating film[,]

~~wherein the contact is positioned above the second insulating film including nitrogen.~~

Claims 13-19: (withdrawn).

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a second insulating film on top of the capacitor to serve as an upper planarized surface;
wherein nitrogen resides ~~on top of~~ all over the upper planarized surface of the second
insulating film[,]

~~wherein the contact is positioned above the second insulating film including nitrogen.~~